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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/729,058 | 12/04/2000 | Anke Krasemann | GR 99 P 5363 | 6468 |

7590 03/29/2002

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EXAMINER

LUU, PHO M

| ART UNIT | PAPER NUMBER |
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2824

DATE MAILED: 03/29/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.
09/729,058

Applicant(s)
Krasemann et al.

Examiner
Pho Luu

Art Unit
2824



-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on _____
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above, claim(s) 1-4 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 5-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- 11) ☒ The proposed drawing correction filed on Dec 4, 2000 is: a) ☒ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- a) ☒ All b) ☐ Some* c) ☐ None of:

- ☒ Certified copies of the priority documents have been received.
- ☐ Certified copies of the priority documents have been received in Application No. _____
- ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

*See the attached detailed Office action for a list of the certified copies not received.

- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- 15) ☒ Notice of References Cited (PTO-892) 18) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 19) ☐ Notice of Informal Patent Application (PTO-152)
- 17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s). _____ 20) ☒ Other: Search History

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DETAILED ACTION

Response to Election/Restriction

1. Applicant's election without traverse of group II, claims 5-20 in Paper No. 7 filed February 19, 2002 is acknowledged.

Priority

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Inventorship

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103© and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

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Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 5-13, 17, and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iwai et al. (US. 4,327,476).

Regarding claim 5. Iwai et al have discloses a capacitive electrode structure. The capacitive electrode (3) structure comprising the steps of a semiconductor substrate (1), a metal oxide layer (MOS) layer formed on said semiconductor substrate, an oxidation (Fig. 1) inhibiting or reduce layer on said metal oxide layer, and on said oxidation (12) inhibiting layer Iwai et al doesn't show the element of electrode apply in metal oxide layer, but does teach the formation of electrode isolation around the MOS capacitor be formed self aligned (column 2, lines 58-61).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to form electrode on said oxidation corrosion while forming a capacitive electrode structure patterns since Iwai et al shows a capacitor electrode structure in a proper depth with a groove and is capable of increasing a capacity of a metal oxide semiconductor capacitor and reducing an area of the capacitor electrode structure.

Regarding claim 6. Iwai et al discloses that wherein said oxidation inhibiting layer is electrically conductive (column 2, lines 48-58).

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Regarding claim 7. Iwai et al discloses that wherein said electrode is formed by a metal layer on said electrically conductive oxidation inhibiting layer (column 2, lines 58-61).

Regarding claim 8. Iwai et al discloses that wherein said electrically conductive oxidation inhibiting layer is composed of tungsten nitride (column 3, lines 34-40).

Regarding claim 9. Iwai et al discloses that wherein said electrically conductive oxidation inhibiting layer is composed of titanium nitride (column 3, lines 34-40).

Regarding claim 10. Iwai et al discloses that wherein said oxidation inhibiting layer is not electrically conductive and said electrode is formed by a polysilicon layer on said oxidation inhibiting layer (column 4, lines 30-35).

Regarding claim 11. Iwai et al discloses that wherein said electrically non-conductive oxidation inhibiting layer is composed of a material having a high dielectric constant (column 1, lines 25-29).

Regarding claim 12. Iwai et al discloses that wherein said electrically non conductive oxidation inhibiting layer is composed of silicon nitride (column 3, lines 22-26).

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Regarding claim 13. Iwai et al discloses that wherein said metal oxide layer is composed of an oxygen rich material having a high dielectric constant (column 1, lines 25-29).

Regarding claim 17. Iwai et al discloses that which comprises a meta barrier layer between said metal oxide layer and said substrate (column 7, lines 14-17).

Regarding claim 19. Iwai et al discloses that wherein said metal barrier layer is composed of silicon nitride (column 3, lines 25-29).

Regarding claim 20. Iwai et al discloses that wherein said oxidation inhibiting layer comprises a nitrogen rich compound for preventing a diffusion of oxygen atoms through said oxidation inhibiting layer (column 7, lines 5-13).

6. Claims 14-16, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iwai et al. (US. 4,327476) in view of Ackerman (US. 5,547706).

Regarding claim 14. The reference of Iwai et al shows all the limitations of the independent claim 5, and dependent claim 13 as noted above except for the metal oxide layer is composed of titanium dioxide as call in claim 14. However, it is well known in the art that the define of Ackerman teaches the metal oxide layer is composed of titanium dioxide (column 2, lines 42-46). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to anodize the processes of metal oxide layer as taught by Ackerman

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in the anodization of Iwai et al in order to accomplishing up the process of capacitive electrode structure.

Regarding claim 15. Ackerman discloses that wherein said metal oxide layer is composed of tantalum pentoxide (column 1, lines 20-25).

Regarding claim 16. Ackerman discloses that wherein said metal oxide layer is composed of aluminum oxide (column 2, lines 42-46).

Regarding claim 18. Ackerman discloses that wherein said metal barrier layer is composed of silicon dioxide (column 1, lines 20-25).

Conclusion

7. Any inquiry concerning this communication or earlier communication from the examiner should be directed to Pho M. Luu whose telephone number is (703) 306-5943. The examiner can normally be reached on Monday through Friday from 9:00am to 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Elms, can be reached on (703) 308-2816. My direct fax telephone number is 7003-746-4261. The official faxes for technology center 2800 should be sent to 703-872-9318. The official after final faxes for technology center 2800 should be send to 703-872-9319.

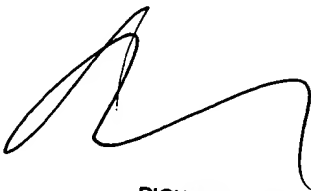
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Any inquiry of a general or relating to the status of this application or proceeding should be directed to the group receptionist whose telephone number is (703) 308-0956.

Pho M. Luu
Art Unit 2824
March, 2002.



RICHARD ELMS
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800